NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION NEWSLETTER

THE RECOVERY OF SOME MILLSTONES FROM AN 1870'S FLOURMILL SITE (S178/8) NEAR WYNDHAM, SOUTHLAND

Neville Ritchie
Then Assistant Director/
Anthropologist, Southland Museum,
now N. Z. Historic Places Trust
Archaeologist, Clutha Valley
Development, Cromwell.

Abstract

A small salvage excavation was undertaken near Wyndham, by staff members of the Southland Museum, initially to recover a single millstone inadvertently uncovered by a farmer whilst laying a field drain. Eventually four millstones and associated fittings were recovered. The rest of the site was not excavated.

Introduction

The archaeological recovery of the millstones from Doull's mill site near Wyndham was an effective co-operative venture between the N.Z. Historic Places Trust, one of its regional committees and a provincial museum within its sphere of influence. With the advent of the Historic Places Amendment Act 1975 similar operations involving historic sites may become increasingly common.

On 3/10/77, a Wyndham farmer, Mr E.R. Plunket, reported to the Museum that he had found what appeared to be a stone 'mill-wheel' (millstone) whilst hand-digging a ditch on his property. Museum staff examined the site the same afternoon. Although the area in the vicinity of the drainage ditch was very boggy, it seemed probable from the surface debris that some structure had formerly stood beside the ditch, rather than the location being merely a dump site. Mr Plunket indicated that he wanted the millstone recovered and placed in the museum, because it was going to affect the flow in his drain. In the interim it was decided to leave the millstone in place while some research was undertaken to determine if there had in fact been a mill there and when it had operated.

The following day Mr Plunket reported that he had found another wheel and some pieces of iron about two metres further up the ditch. I revisited the site in company with Mr R.J. Beck, Director of the Southland Museum, and Mr C. Kerr, Assistant Secretary and historian of the Southland Regional Committee of the Trust. That evening Mr Kerr found some documentation that confirmed our suspicions that the site was over 100 years old. As the farmer wanted the millstones removed (and the museum did not have millstones of this type) it was decided to apply to the Trust for an authority to remove them. This was granted on 2/11/77 (Authority No. 1977/24) subject to the whole site being mapped and a report produced.

Location

The mill site is located 3 km from Wyndham on the west side of the Wyndham-Mataura road. This location is about midway between the Mimihau and Mataura Rivers. The mill was powered by water conveyed by a race dug to divert water from the Mimihau River, through the mill's waterwheel and then on to the Mataura River. This race, marked on an 1879 survey map, is visible today except in the immediate vicinity of the mill site itself. The water was probably diverted through the mill's waterwheel by some form of fluming, but no trace of it is now evident.

History of the mill

Wind and water-powered mills for grinding flour were first used in New Zealand in the 1840's and within the next two decades many townships in districts where wheat growing was practicable had their own mill. After about 1850 the Canterbury-North Otago plains became the 'recognized granary' of New Zealand, and many local mills closed or amalgamated to form larger units.

In a review of the previous year written by Joseph Mackay in 1873 and published in the Mataura Ensign he stated that "the erection of Mr Doull's flourmill at Wyndham enabled the settlers to grow wheat though chiefly for home consumption in the district". The view was expressed that "with the early prospect of railway communication.... the district will speedily become one of the largest and most successful grain producing localities in the Colony". Although Mackay places the erection of the mill in 1872, an earlier directory quoted by Beattie (1962:118) implies it was in existence in 1871, if not 1870. Timber for the mill was cut by Messrs Andrew and Robert Muir using a water powered mill sited on the Marairua Stream (Mataura Ensign, 18/6/1917).

On page 12 of the Southland Weekly News of April 6th 1878 the following notice appeared "J. & J. Ramsay have purchased from Mr Doull,

the Wyndham Flour and Oatmeal Mills." Joseph Mackay also notes in his annual review in the Ensign in 1879 that "the flour mill is now under the control of J. and J. Ramsay", but after this date I have found no further reference to either the existence of the mill or its eventual closure. No photographs of the mill are known to exist.

Several old identities were interviewed in an effort to find out when and why the mill closed and when the buildings were demolished or collapsed. No further significant information was forthcoming. It appears that the mill ceased production around about 1885. One elderly informant who walked past the mill site almost every day between 1903 - 1911 on her way to school stated that "the mill was out of action then and the roof had collapsed". She described it as a "square brick building, like a castle" and noted that "the walls stood for many years after that".

A 1905 survey map has the words "Old Mill Site" written on it, suggesting that the mill had been closed for some years prior to that date. Information from other elderly residents of the Wyndham area indicated that the stark walls of the building stood until around 1920. No one could recall if any part of the structure had ever been intentionally demolished or removed. The building appears to have gradually collapsed from neglect, presumably forming the slight raised mound on which brick debris is visible protruding through the grass today.

The excavation

From the outset, museum staff were unwilling to excavate all, or even a large portion of the site (an area of c. 25 x 20 metres is littered with debris, mainly bricks) primarily because the museum does not have the resources, time or manpower. Our principal aim was a salvage excavation to recover the millstones. These are historically and visually interesting, and were thwarting the farmer's ditching programme. We also hoped to establish whether the mill was perhaps gutted by fire possibly forcing its closure, and whether any stratigraphic relationship existed between the location of the millstones and the rest of the site.

The excavation was within and adjacent to, a ditch dug by the farmer through a swampy elongate depression. The depression was caused by a spring, and throughout the excavation muddy water was continually oozing, in a small but steady flow from the banks. This had to be diverted where possible around the millstones.

The soil structure could best be described as a black sloppy mud mixed with pieces of rotten sticks, rounded river cobbles, sheep bones and decaying vegetation. The black colour of the soil appears to have

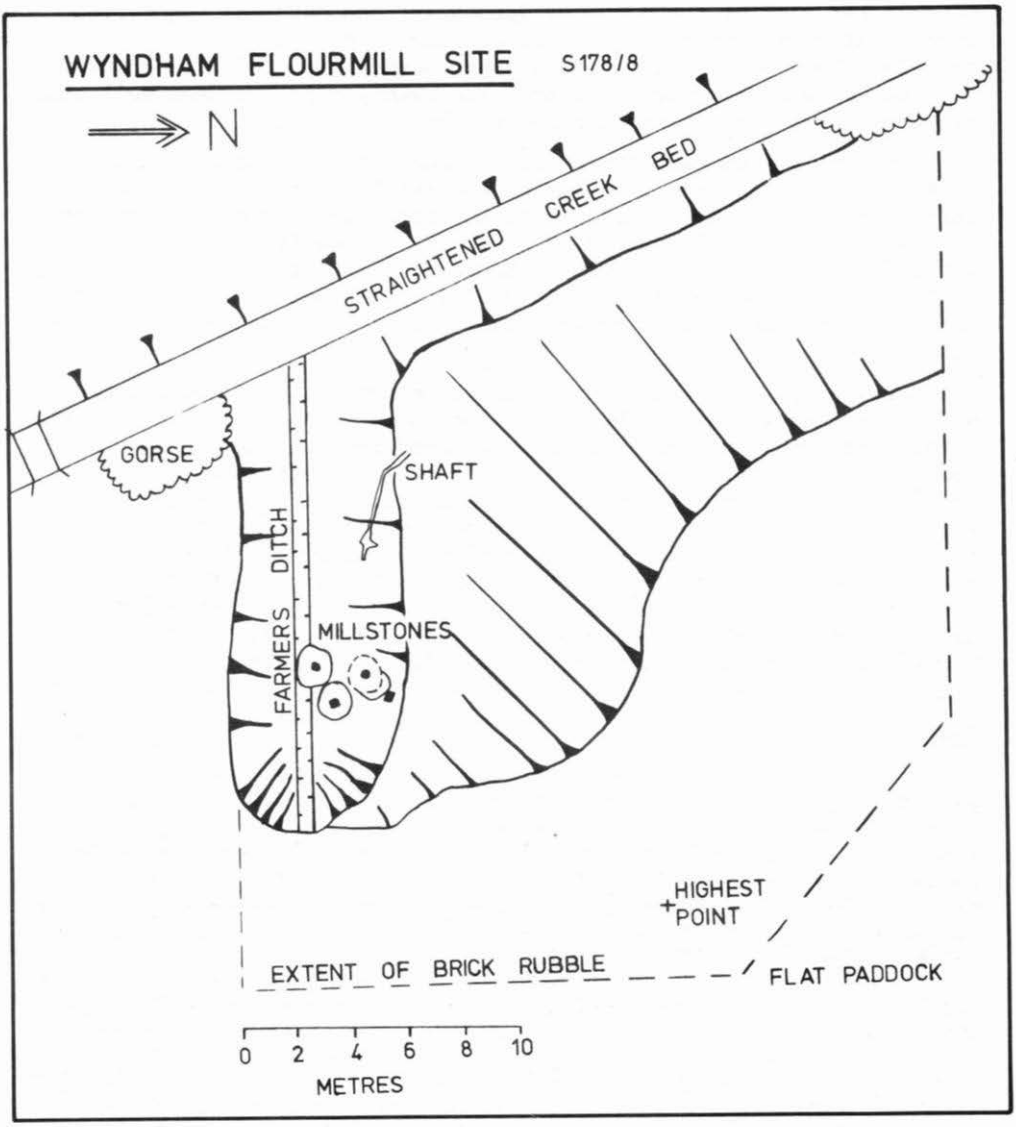

Figure 1. Wyndham flourmill site.

been caused by the decomposition of sheep carcases (some bearing plastic ear tags of the previous landowner) and decaying vegetation under peat swamp conditions. This created a soil acidity which tended to reduce iron to iron sulphide and produced vivianite on the bones. No clear stratigraphy was evident. The swampy soil had been well mixed by stock trampling and rubbish deposition.

The excavation was limited to an area about 2.5 metres square protruding to the north side of the now infilled ditch. If at some subsequent date, someone desires to undertake further excavations at the site, the ditch is marked by a row of Pukerau field pipes at a depth of about 80 cm. The pipes should be easily relocated. The swampy hollow was laid out with a string grid into two metre squares, so that all recovered items could be accurately related to each other and the rest of the site.

Originally it was thought it might be possible to lift out each millstone intact, but as they were exposed it became apparent that the metal bands that formerly held the segments together had largely corroded away. Consequently, we lifted out each millstone, segment by segment. As each millstone weighed an estimated 150 kg we would probably have had some difficulty in moving them intact with the equipment at our disposal. Each segment was numbered, lifted out carefully and reconstructed on the bank or in the back of the museum's trailer. The stones were labelled with marker pen, but this tended to smudge on the damp rock so we were forced to use a crayon. Later the segments were permanently numbered with paint on their rough reverse sides.

The millstones

The major items excavated were four millstones, each 1.2 metres in diameter and averaging 14 cm in thickness. Each wheel was made up of 16 interlocking segments, 12 in a perimeter ring and 4 making up an inner ring. The segments were originally bound together by thin iron bands around the circumference of each millstone. In the centre of two of the millstones there is a round hole, 28 cm in diameter. The other two have a square hole measuring 25 cm. These correspond to the upper and lower millstones.

Millstones were used in pairs, one being held stationary, the other rotating above it, in a horizontal plane. Grain is poured through the hole (the eye) in the centre of the rotating millstone (or runner stone), flowing into shallow grooves (called channels or furrows) which radiate from the centre of the stationary stone. The channels lead the grain onto the flat grinding section, called the land, and to the wheels perimeter where it emerges as flourmeal. From here the flourmeal falls

into the space between the lower wheel and its casing and runs down a spout into storage bins. The flourmeal is then bolted to produce flour.

It is notable that all four millstones found in this excavation were grooved but the differing shape of the centre hole, two being square and two being circular suggests they were used in pairs.

Most New Zealand millstones were imported from England or the Continent. I am unaware of any millstones which were manufactured in New Zealand, but there probably were localised instances of New Zealand manufacture. Two kinds of stones were in general use: Derbyshire 'peakstone', a conglomeratic sandstone taking its name from the Peak District in England, where it was quarried in one piece from the in situ rock, and the French 'burrstone' (or buhrstone), a silicified limestone. The burrstone wheels differed in that the stone was much harder, and that it was quarried in small blocks, shaped like the stones of an arch and built up to the required diameter and cemented together with plaster of Paris. The stone is quarried at La Ferté-sous-Jouarre in the Paris basin.

The Wyndham millstones fit the description of the French burrstones. The stone is a hard (H = 7) fawn coloured siliceous rock. Each millstone is composed of neatly ground, but irregularly shaped segments bound with thin iron hoops. In each case the reverse or non grinding surfaces are unground and have been built up with plaster of Paris containing burrstone rubble. This was done presumably to save plaster of Paris, but may also have served to improve the balance of the wheel. Because of the sodden nature of the sub-stratum the plaster of Paris had largely dissolved and intermixed with the soil producing a fine light brown material of a creamy consistency.

Other artefacts

Underneath one millstone there was a badly oxidised iron centre section with the words 'Hughes & Son, London' cast in it. The iron had been reduced to a black iron sulphide, probably marcasite, but retaining the shape of the original component. Possibly the stone was cut from the French quarries and the millstones were later assembled at an English foundry.

Under a second millstone a metal collar that fits into the centre of the millstone was found when the segments were removed. Each millstone was surrounded by rusted fragments of the iron bands which originally contained the segments. Some of the stones had two bands, one seemingly having been put on to supplement a lighter one. Two sections were recovered spanning about half the circumference of one of the millstones, but most of the bands were in fragments a few centi-

metres long. Three other metal objects of some note were recovered - these included 2 iron keypieces which may have been used to lock the upper wheel on to its shaft, and an octagonal flat iron plate which held the timbers radiating from the shaft of the waterwheel. Besides these there were several other nondescript iron components such as 'U' bolts and iron rings. These pieces were rusty but generally in solid condition.

Within the debris dumped in the hollow there were several pieces of timber. Many of these were thin sticks of manuka which were probably dumped into the hollow during land clearing operations. However, there were some dressed and waterlogged planks. These pieces were up to 1.2 metres in length and bear no sign of attachment, but were possibly part of the waterwheel. A few burnt pieces of timber were uncovered adjacent to the wheels but these were intermixed with unburnt timber. One of the millstones appears to have been burnt on the upper surface.

On the 17/11/77 I assisted the farmer to lay Pukerau field pipes in the ditch and backfill it. In the process we encountered 9 planks (20 cm wide x 5 cm thick) set transversally across the ditch. These planks were in situ and in the area where the first millstone was found. The planks may have served to prevent scouring under the waterwheel. They were left as they were found, the field pipes being laid across the top of them.

The brick rubble of the mill revealed no clues as to the origin of the bricks as they bear no identifying marks. However, they were probably made by one the early Southland brickworks, and some comparative mineralogical tests may determine the source of the bricks.

On the north side of the ditch, 3 metres of a large steel shaft protrudes from the bank. The shaft is hollow, 8 cm in diameter and has what may have been part of a clutch or governor at one end. It has been bent where it protrudes from the ground. Originally it probably transmitted the energy from the revolving waterwheel to the millstones.

Conclusion

Despite the fact that the mill site is little over 100 years old, very little has been recorded about it, particularly with regard to its final years and possible subsequent uses.

The mill appears to have been in operation by 1871 and building probably commenced in 1870. It continued in use as a mill until about 1885, and any subsequent use is unknown. By 1900 the building was a stark ruin and seems to have virtually collapsed by 1920.

The small excavation and research revealed that the brick building was located on the north side of the ditch, into which an undershot waterwheel would have protruded from the side of the building. The ditch must formerly have been part of the Mimihau-Mataura mill-race, the water being conveyed to the waterwheel by fluming.

The millstones may have fallen down the side of the ditch as the old mill collapsed but there is a reasonable possibility that they were deliberately removed from the building, perhaps to facilitate some other use, and dumped there.

The segmented millstones are made of French burrstone and may have been assembled or purchased through an English agent 'Hughes and Son' of London.

Although one millstone appeared burnt on the top side and was surrounded by a few pieces of burnt wood, the evidence from the limited area excavated is not conclusive enough to show that the mill was gutted or badly damaged by fire at some stage. The evidence of burning was probably caused by the burning of cleared scrub in the ditch. None of the exposed bricks appeared to have been burnt.

Although we interviewed several elderly people in the Wyndham area, we were unable to glean any further clues about the mill's demise. We did learn some useful information, but overall the interviews only highlighted the extent to which people take for granted the places around them.

All recovered items from the excavations are held in the Southland Museum. It is intended that one set of the millstones will be displayed in the museum's History and Technology gallery now under construction.

I would be interested to hear from anyone who has any additional information or photographs of the old Wyndham mill, or is aware of any instances of New Zealand manufacture of millstones or has other relevant information about early New Zealand milling.

Acknowledgements

I would like to acknowledge the co-operation and assistance of Mr E.R. Plunket, the landowner, who promptly informed the Southland Museum, after he had found the first of the millstones which led to the eventual discovery of the location of the mill site. Thanks are also due to Mr R.J. Beck, Director of the Southland Museum and the other museum staff who participated, to Mr C.D. Kerr of the Southland Regional Committee of the N.Z. Historic Places Trust and to those past and present residents of the Wyndham area who contributed useful information.

References

Anon	1962	Dictionary of Geological Terms. Dolphin Reference Books Edition, Doubleday & Co, New York.
Beattie, J.H.	1917	'Southern Pioneers', series of articles in Mataura Ensign
	1962	A History of Gore and Surrounding Districts 1862-1962. Gore Publishing Co., Gore.
Encyclopedia	1974	Brittanica Micropedia Vol. 6, p.900
Irwin, I.S.	1968	Mimihau, The First 100 Years.
Kerr, C.D.	1977	pers. comm. Assistant Chairman, Southland Regional Committee, N.Z. Historic Places Trust.
Lands & Survey Dept		Invercargill-early survey maps, Wyndham District.
Mackay, J.	1873	Reports in Mataura Ensign in 1870's.
Mataura Ensign		Newspaper, formerly published in Mataura
Mills, Dick & Co.	1878	Directory, Otago-Southland
Salt, L.E. (ed.)	1965	Oxford New Zealand Encyclopedia, Oxford Univ. Press.
Southland Museum	1977	Correspondence relating to this investigation
Wailes, R.	1948	Windmills in England, Chas Skilton, London.
Weekly News		former Southland newspaper